3-4
LOAN CALCULATIONS

OBJECTIVES

Calculate the term (length) of a loan.
Create an amortization table.

You will need:
• Student Notes
• Textbook
• Calculator
• 3-2 Notes
• Notebook Paper
• Pen or Pencil
No Ear Buds!!!!

Cell Phones: Down & Dark
Claude wants to borrow $25,000 to purchase a car. After looking at his monthly budget, he realizes that all he can afford to pay per month is $300. The bank is offering a 5.9% loan. What would need to be the length of his loan be so that he can stay within his budget?

Monthly Payment Formula:

\[
M = \frac{P \left( \frac{r}{12} \right) \left( 1 + \frac{r}{12} \right)^{12t}}{\left( 1 + \frac{r}{12} \right)^{12t} - 1}
\]

- \( M \) = monthly payment \( \text{300} \)
- \( P \) = Principal \( \text{25,000} \)
- \( r \) = annual interest rate (converted) \( .059 \)
- \( t \) = length of investment in years \( \text{t} \)
Claude wants to borrow $25,000 to purchase a car. After looking at his monthly budget, he realizes that all he can afford to pay per month is $300. The bank is offering a 5.9% loan. What would need to be the length of his loan be so that he can stay within his budget?

Monthly Payment Formula:

\[
M = \frac{25,000 \left( \frac{.059}{12} \right) \left( 1 + \frac{.059}{12} \right)^{12t}}{\left( 1 + \frac{.059}{12} \right)^{12t} - 1}
\]

- \(M\) = monthly payment \(\$300\)
- \(P\) = Principal \(\$25,000\)
- \(r\) = annual interest rate (converted) \(.059\)
- \(t\) = length of investment in years \(9\) years

Menu, 3, 1

Slide 4
Example 2 – You try it!

In Example 2, what impact would an increase in the monthly payment of $50 have on the length of the loan?

\[ \frac{P}{r} \left( \frac{1}{12} \left( 1 + \frac{r}{12} \right)^{12t} \right) \]

Monthly Payment Formula:

\[ M = \frac{P \left( \frac{r}{12} \right) \left( 1 + \frac{r}{12} \right)^{12t}}{\left( 1 + \frac{r}{12} \right)^{12t} - 1} \]

\[ M = \text{monthly payment} \quad 350 \]

\[ P = \text{Principal} \quad 25,000 \]

\[ r = \text{annual interest rate (converted)} \quad 0.059 \]

\[ t = \text{length of investment in years} \quad t \]
Example 2 – You try it!

In Example 2, what impact would an increase in the monthly payment of $50 have on the length of the loan?

Monthly Payment Formula:

\[ 350 = \frac{25,000 \left( \frac{.059}{12} \right) \left( 1 + \frac{.059}{12} \right)^{12t}}{\left( 1 + \frac{.059}{12} \right)^{12t} - 1} \]

- **M** = monthly payment **350**
- **P** = Principal **25,000**
- \( r = \) annual interest rate (converted) **.059**
- \( t = \) length of investment in years **t**

Menu, 3, 1

7.4 years
John does not have a very good credit rating. In January of 2016, he found a lending institution that was willing to loan him $100,000 for 15 years at a higher than normal interest rate of 7.5% because of his poor credit rating.

a. What will his payment be?

On your phone go to:

http://www.bankrate.com

Click on the 3 bars next to “Bankrate”

Select Loans

Select Loan calculator
Example 3

John does not have a very good credit rating. In January of 2016, he found a lending institution that was willing to loan him $100,000 for 15 years at a higher than normal interest rate of 7.5% because of his poor credit rating. The loan will start on today’s date.

a. What will his payment be?

Loan Amount: $100,000
Loan term in years: 15
Interest as a %: 7.5

$927.01

Push Calculate button
John does not have a very good credit rating. In January of 2016, he found a lending institution that was willing to loan him $100,000 for 15 years at a higher than normal interest rate of 7.5% because of his poor credit rating. The loan will start today.

b. What will his balance be after one year?

$96,249
Example 3

John does not have a very good credit rating. In January of 2016, he found a lending institution that was willing to loan him $100,000 for 15 years at a higher than normal interest rate of 7.5% because of his poor credit rating. The loan will start on Jan. 1, 2017.

c. Fill in the amortization schedule for the first 3 months.

<table>
<thead>
<tr>
<th>Date</th>
<th>Principal</th>
<th>Interest</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>302</td>
<td>625</td>
<td>99,698</td>
<td></td>
</tr>
<tr>
<td>304</td>
<td>623</td>
<td>99,394</td>
<td></td>
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<td>621</td>
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d. Plot the interest payments.

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e. Why are you paying less interest each month?

Each payment that you make reduces the principal balance, which means less interest is owed for the next month.
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So...does your payment get reduced each month?

No. So where does the “extra” money go? It goes toward the principal.
Please work on your assignment. It is due at the end of next class.

| Grade goes here | Read Pg: 173 to 176 | Do Pg 177: #2-5, 7-10, 11a-d, 12a-d | Last First  
P___  
A:3-4 |